2003 Summer Opportunities for NOAAs Northeast Fisheries Science Center

James J. Howard Lab, Highlands, NJ

Administrative Contact: Cathy Noonan 732/872-3025

Habitat affinity of demersal fishes in coastal waters

Investigator: Dr. Mary Fabrizio

Black sea bass and summer flounder use New Jersey coastal waters for feeding and spawning. The aim of this project is to determine habitat use by these species using state-of-the-art ultrasonic tagging techniques.

Students will have the opportunity to participate in work on board the NOAA vessels, R/V Nauvoo and R/V Gloria Michelle, which will be used to take scientists to the study site (each trip is less than 8 hours long). Procedures used in this investigation include application of anesthetics to black sea bass and summer flounder, surgical implantation of transmitters (tags), retrieval and re-deployment of acoustic arrays, and downloading of data from instruments at sea.

Resistance of Lobster to Environmental Stressors

Investigator: Andy Draxler

Ongoing studies on the response of lobsters to environmental stressors have concentrated on survival, bacterial level and immune function of (intentionally) infected lobsters. This summer, an intern is needed to work on experiments examining the baseline response of healthy lobster to hypoxia and thermal stress. The proposed experiments will expand on the work examining resistance in infected lobsters and provide critically baseline information for understanding the cause of the mass mortalities in Long Island Sound.

Contact: Dr. Andrew Draxler andrew.draxler@noaa.gov.

Coastal Ecology Branch

Investigator: Various

A summer student is sought to participate in a range of lab and field studies of the Coastal Ecology Branch of Howard Lab (Sandy Hook, Highlands NJ). The field work could include studies of relationships between hard clams and their habitat in Raritan Bay, and effects of fishing gear on those habitats; an attempt to restore an oyster reef in the bay, and use of the reef by resource species; and/or surveys of fish-habitat relationships in the inner New York Bight.

There is the possibility of a 12-day cruise (July 28-August 8) east of Cape Cod, on our 180' research vessel ALBATROSS. Part of the student's duties would be to work in our "benthic" (bottom-living organisms) laboratory, to learn procedures for sorting invertebrates from sediments, identify the commonest species, and also help conduct our program for benthic interns.

J. James Howard Lab, contd.

Assessment of Condition of Bluefish from Different Estuaries

Investigator: Dr. Jennifer Samson

Students will assist in ongoing research on the impacts of habitat quality on the condition of young of the year bluefish. The emphasis will be on field collections of bluefish from several different estuaries along the New Jersey coast, but students will also have the opportunity to participate in some laboratory aspects of this study.

Field collections involve beach and boat work and will include deploying seine nets, fish dissections and data entry. Lab work will include sample preparation and immunological assays.

Assessment of bluefish cohorts in a mid-Atlantic estuary

Investigator: Carol Meise

A field study is planned to examine the relative strength of the spring and summer bluefish cohorts in the Navesink River-Sandy Hook Bay estuarine system. Students would be involved in deploying and retrieving gillnets, stomach analyses, length frequency measurements, seining and data entry. Additional experience can be gained with sample evaluation and data analysis.

Early Life History

Investigator: Chris Chambers

The candidate would participate in one or all of three projects underway within the Life History and Recruitment Group.

These projects are: 1)the life history, ecology, and behavior of fishes of the Lower Hudson River, 2) laboratory evaluations of contaminant effects on Atlantic tomcod, a key species of the Hudson River fish community, and 3) quantifying growth and developmental rates of egg, larval, and juvenile goosefish. Duties would include participation in the methods of collecting, processing, culturing, and aging fish; condition, morphometric, and behavioral analyses; experimental design; image data acquisition; and data interpretation and presentation.

Maine Field Station, Orono, ME

Atlantic Salmon

The Atlantic salmon research projects at the NEFSC need the assistance of a summer student to accomplish critical tasks related to information management, database management and field sampling operations. Information management work would consist of entering, auditing, and editing: historical fish data, spatially-referenced data in GIS, and technical information related to ongoing projects. These data may require additional manipulation and organization, including the development and implementation of an efficient data directory structure for the NEFSC public

network drive (S:) .Specific tasks related to GIS would include: metadata conversion and generation, installation of software updates and license management, field data projection and visualization, and other mapping projects in support of NEFSC initiatives. This work would comprise approximately 35% of the successful candidate's time. Database management work would consist of entering, auditing, and editing: smolt assessment data; water quality data; sample tracking; historical time-series of climatic and flow data and technical information related to ongoing projects. This element would comprise approximately 35% of the position. The remaining 30% of this position would be in support of field operations to assess smolt, post-smolt, and adult abundance. This position will also have additional duties as required by staff that includes participation in field work, laboratory work, hatchery sampling and fish marking as directed by staff. This position offers unique opportunities for the successful candidate to gain experience in state-of-the-art assessment techniques and the opportunity to learn database structure and overall information management.
Contact: **John Kocik, PhD** 207/866-7341 John.Kocik@noaa.gov

Milford Lab, Milford, CT

Biotechnology Branch

Phytoplankton Trophic Interactions Project

The Phytoplankton Trophic Interactions Project at the Milford Laboratory has developed a research program directed at answering questions about the interactions between harmful algae and higher trophic levels. Unique capabilities in microalgal culture and rearing of shellfish and finfish, applied first and foremost to aquaculture research, allow controlled exposures of marine animals to harmful algae. Collaborative relationships with regional universities and research institutions expand in-house expertise. Specifically, the Project has an on-going, collaborative research project with SUNY Syracuse, funded by ECOHAB (the national research program on harmful algae), on effects of several microalgal taxa upon bay scallops and microzooplankton.

Opportunities for student training in this active research program cover a number of sub-areas: effects of water chemistry, particularly nutrients, upon microalgal growth; mechanisms of interaction between harmful microalgae and other organisms; and quantitative determination of effects thresholds. Beyond these specific scientific sub-disciplines, students will be exposed to the general principles of scientific research, including experimental design, replication, statistical analysis of results, documentation of findings, and report preparation. In most cases, we will attempt to match the interest of the student with an on-going research project; however, experiments may be added if the student has a specific idea or motivation outside of our planned research. As scientific research is becoming increasingly collaborative, we stress a team aproach to projects in which each participant has responsibilities upon which the rest depend; thus, the student will benefit from a "real-world" work experience as well as exposure to the scientific method.
Contact: **Gary Wikfors, PhD** 203/882-6525 Gary.Wikfors@noaa.gov

Shellfish Genetics and Breeding

The focus of the Genetics research program at the Milford Laboratory is to investigate the application of genetics and breeding technology for improving growth and survival rates of the commercial bay scallop, Argopecten irradians, which could ultimately contribute to increased commercial production and recreational harvesting. Three major approaches are being explored: breeding, population genetics, and field evaluations. Responses to selective breeding and inbreeding are being determined by developing lines for increased growth. In addition, genetic diversity of various stocks and populations is being ascertained to support or complement breeding and broodstock management. Studies of habitat suitability and field evaluations also are being conducted for stock enhancement and restoration, along with line development and assessment of scallops.

The employee will assist with various projects for evaluating genetic lines, from spawning adults and rearing of larval and post-set bay scallops, to collection of data for genetics studies on growth and survival. Tasks include providing assistance in the maintenance and operation of shellfish culture facilities, and sampling and measuring scallops of various stages from eggs to adults. Observations will be made on differences in growth and survival of scallops under various conditions, which could provide opportunities for independent study. There are 4
both laboratory and field components.

Contact: **Sheila Stiles, PhD** 203/882-6524 Sheila.Stiles@noaa.gov

Culture Systems and Habitat Evaluation Branch

Finfish Aquaculture

The culture of marine finfish has been conducted at the Milford Laboratory of the National Marine Fisheries Service over the past 7 years. We are in need of a summer intern to participate in the culture of black sea bass here at Milford. The goal of the research is to develop a protocol for spawning and rearing these finfish to a market-size within a two year period. The individual selected will be involved in collection of the adult fish, egg collection, the care and feeding of the adult spawning brood stock, and the maintenance and cleaning of the culture systems. They will also work in the culture and counting of live prey items including algae, rotifers, and brine shrimp to be fed to the larval fish. The individual will learn how to measure and record water quality parameters including measurements of ammonia, seawater temperatures, salinity, dissolved oxygen, and pH from all fish tanks.

In addition, there is work involving operation of filter systems, automatic fish feeders, timers, ultraviolet sterilizer lamps, and recirculating seawater systems. Measurements of lengths and weights of larval and juvenile fish in feeding experiments will be recorded and entered onto computer spreadsheets for analyses. There will be ample opportunity for the students involvement in their own research project.

Contact: **Dean M. Perry** 203/882-6530 Dean.Perry@noaa.gov

Habitat Evaluation and Enhancement

One of the goals of Milford Laboratory's aquaculture efforts is to provide a source of fish that can be introduced into the wild for potential stock enhancement. Strong orientation to structure and limited migrations of black sea bass and tautog, make them good candidates. We currently are investigating both an offshore reef used by black sea bass, as well as a nursery and adult habitat for tautog in New Haven Harbor. We are determining the spatial distribution and abundance of young-of-the-year, juvenile, and adult fish. An intern will assist in field surveys and ecological experiments conducted in nearshore habitats. Beach seining and gear deployed from small boats will be used to sample young fish. Sediment and vegetation will be collected to characterize habitat, and biochemical laboratory analyses will be employed to determine growth potential of fish and infer habitat quality. Predators and food habits of young black sea bass and tautog will be identified and quantified. Some fish may be marked with visible or wire-coded tags and released. Recaptured fish will be analyzed to determine time and location of release and growth rate. Adult fish will be

surgically implanted with sonic tags, released and their movements monitored. Environmental conditions will be measured with electronic instruments.

Data management, analysis**,** and development of GIS maps will be part of the assignment.
Contact: **Ronald Goldberg** 203/882-6546 Ronald.Goldberg@noaa.gov

Shellfish Aquaculture

The Milford Laboratory shellfish aquaculture (shellfish farming) unit is conducting research on bay scallops, hard clams and oysters. An intern will be part of a program determining the commercial feasibility of raising shellfish in state of the art recirculating seawater systems. Incumbent will work in a marine laboratory research shellfish hatchery rearing larval and juvenile shellfish under the direction of a research fishery biologist. You will be assisting in experiments determining optimum feeding concentrations required to maximize growth of bivalves. You will learn about innovative automated control systems developed for experimental shellfish culture systems. He/she will perform daily tasks such as recording temperatures, pH, dissolved oxygen and other water quality data. You will work with one or two others to maintain various shellfish organisms while conducting laboratory and field experiments. Microscope work, recording of data, measuring shellfish and computer skills will be utilized. Incumbent must be able to lift 15 pounds, some work may occur on a research vessel.
Contact: **James Widman** 203/882-6508 James.Widman@noaa.gov

Narragansett Lab, Narragansett, RI

Population Biology Branch
Apex Predators Program

The Apex Predators Program (APP) requests summer assistance for the Cooperative Shark Tagging Program (CSTP). During the summer, hundreds of inquiries are made to the APP for tags and information on tag and recapture methods. These requests come in the form of phone, fax, and mail. Additionally, since this is by far the most active time of year for the fishermen, the majority of our tag recapture data is obtained between June and September. The fishing season is short in the northeast and therefore, it is imperative that the fishermen obtain their tags as quickly as possible. Due to our active summer field season, the majority of the permanent APP staff are frequently away from the Lab and unable to assist in fulfilling requests for tags. We request a summer student to interface with the fishermen by answering all forms of communication as well as by processing the requests and sending out the tags and information. This person would also be required to code and file incoming tag cards. To maintain the credibility of the CSTP and keep the taggers active, it is vital that we use summer help.

Contact: **Nancy Kohler, PhD** 401/782-3332 Nancy.Kohler@noaa.gov

Early Life History Group

The Early Life History Group and Fish Health Group at the Narragansett Laboratory are looking for a summer student to assist with ongoing experiments on growth and culture of marine fishes and fish health projects. The student's duties would be to assist in maintenance of the seawater delivery systems, clean tanks and filters, feed cod and haddock broodstocks and juveniles, monitor water quality, and assist in the culture of algae and rotifers. The student would also measure eggs and larvae using an image analysis system, and weigh freeze-dried larvae to contribute to experiments on the effects of photoperiod, feeding level and temperature on fish larvae.

Duties for the fish health component of the job would include preparing materials for field and laboratory studies, assisting in field collections and laboratory experiments, editing and entering data into a computerized database for fish health projects, performing basic statistical analyses on field and lab generated data, performing literature searches and updating a ProCite database.

Contact: **Larry Buckley** 401/874-6671 lbuckley@gso.uri.edu

Ecosystems Monitoring Group

The Ecosystems Monitoring Group has need for a full-time summer student to assist in the calculation and visualization of spatio-temporal coincidence and other relationships between plankton and the physical and chemical environment of the northeast shelf ecosystem (80%). Data from both the research vessel and the continuous plankton recorder (cpr) surveys would be used. At a minimum, the technique would be documented in the form of a NOAA Tech. Memo.

The summer student would also assist in preparation of plankton samples for shipment to Poland, and for research vessel survey preparation (20%).

Contact: **Carolyn A. Griswold** 401/782-3273 Carolyn.Griswold@noaa.gov

Narragansett Lab, contd.

Office of Marine Ecosystem Studies

The Narragansett Bay Study is looking for a summer student to assist with a series of monthly transects of the Bay. The student's responsibilities will include readying an advanced undulating oceanographic recorder for deployment, participating on the cruises, down-loading and reducing data, and processing plankton samples from a continuous plankton recorder. The student will also assist in analyzing long term trends in Narragansett Bay from the 5 year time series of this program. The applicant should have a familiarity with the plankton of the Narragansett Bay area, and a working knowledge of the Matlab programming language.

Contact: **Mark Berman** 401/782-3243 mberman@mola.na.nmfs.gov

National Systematics Laboratory, Washington, DC

National Museum of Natural History, Smithsonian Institution

The student would help with a systematics-type project at the museum.

Contact: **Michael Vecchione** 202/357-4990 vecchione.michael@nmnh.si.edu

Woods Hole Lab, Woods Hole, MA

Atlantic Salmon, Scale Image Analysis

The Atlantic salmon research projects need the assistance of a summer student to accomplish critical tasks related to image processing and database management. Image processing laboratory work would include scale/otolith preparation, cleaning, and analysis with our lab's image analysis system. These data will also require operator auditing and some additional formatting and processing. This work would comprise approximately 60% of the successful candidate's time. Database management work would consist of entering, auditing, and editing: historical scale archive data; historical time-series of climatic data; and databases of citations related to the NMFS Atlantic salmon program and status review. This element would comprise approximately 40% of the successful candidate's time. This position will also have additional duties as required by staff that includes participation in field work, laboratory work, hatchery sampling and fish marking as directed by staff. This position offers unique opportunities for the successful candidate to gain experience in state-of-the-art image analysis and the opportunity to learn database structure and management.

Contact: **John Kocik, PhD** 207/866-7341 John.Kocik@noaa.gov

Data Management Systems (DMS)

Assist in the design, development and implementation of web-based forms to support data processing for various scientific database systems. Learn to manipulate data using the Oracle Relational Database System.

May participate on a NEFSC cruise by serving as a member of the scientific party.

Within the Unix (Sun Solaris) environment, learn to write computer scripts in languages such as C-Shell, PERL, Oraperl, C++, Visual Basic, etc. while assisting the development staff.

Review status of projects with supervisor. Provide written status report at end of internship. Participate in scientific, technical, staff or personnel related meetings as appropriate.

Contacts: **Alan Kohuth**, Chief, Systems Management Group Alan.Kohuth@noaa.gov
Joan Palmer, Chief, DMS. Joan.Palmer@noaa.gov

Population Biology Branch
Fishery Biology Program

Historically the Fishery Biology Program has provided students with a "hands on" experience in a fisheries research laboratory environment. For the summer of 2003, we have identified the following activities for which a prospective student would be responsible:

Age sample preparation including: impressing scales; mounting, sectioning, and baking otoliths; cleaning or sectioning shells; and processing of freezer samples.

Handling and storage of age samples from survey cruises, commercial and observer samples, and other sources, and coordination of logistics and supplies associated with the collection of these samples.

Assist in computerized age data entry and other age database tasks.

Participate in age data collection aboard research vessel surveys or at commercial ports as necessary.

Although Items 1 and 2 above will comprise the majority of the student's duties, current database needs might result in Item 3 being elevated in priority for a candidate with strong computer skills. The prospective student would be able to go to sea on a research vessel survey if interested.

Contact: **Jay Burnett** 508 495-2286 Jay.Burnett@noaa.gov